

US Army Medical Research and Materiel

Technology Available for Licensing



Features and advantages:

- **Identification process takes 2 - 4 hours versus traditional 48 - 72 hours**

- **Could use ethidium bromide as a DNA stain and eliminate need for radioisotope in the assay**

- **Identified over 95% of human *Shigella* serotypes in samples collected from**

Patent Status

- **Process could**

Point of Contact

laboratory technician is not required

Simple PCR Technique for Detecting and Differentiating Bacterial Pathogens

This invention provides a simple polymerase chain reaction (PCR) procedure for the detection and differentiation of *Shigella* from other pathogenic *Escherichia coli* isolates, such as enteroinvasive *E. coli* (EIEC) and enteropathogenic *E. coli* (EPEC). Serotype-specific primers derived from the *rfc* genes of different *Shigella* strains were used to identify the most prominent *Shigella* serotypes, such as *S. sonnei*, *S. flexneria*, and *S. dysenteriae*. More than 95% of the serotypes responsible for the reported Shigellosis cases were identified by the primers.

Bacillary dysentery, mainly caused by *Shigella spp.* and genetically-related EIEC, accounts for a significant number of acute diarrheal diseases worldwide. Current techniques involve various centrifugations and lengthy incubations with multiple enzymes, and do not differentiate between *Shigella* isolates and other pathogenic *E. coli* strains, or between different *Shigella* serotypes. The identification of specific *Shigella* or EIEC serotypes is critical since selection of an antibiotic for treatment of dysentery is based on the causative agent.

The invention provides PCR products of differing molecular mass that correspond to specific *Shigella* species and serotypes found in a sample. The method is potentially applicable to other pathogens containing an *rfc* gene.

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KEYWORDS: *Shigella*; shigellosis; *E. coli*; PCR identification; detection; differentiation

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